

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. After amending the claims as set forth above, claims 1-19 are now pending in this application.

Applicants wish to thank the Examiner for the careful consideration given to the claims.

Rejection of claims 1-2, 4-5, 10-13, and 15 based on Szczyrkowski and Wang

Claims 1-2, 4-5, 10-13, and 15 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over U.S. Patent 5,558,750 ("Szczyrkowski") and U.S. Patent 6,358,851 ("Wang"). For at least the following reasons, this rejection is traversed.

Claim 1 recites, among other things, a method comprising the following steps: providing a vacuum; providing an electrode in said vacuum; providing a substrate in said vacuum, said substrate having no contact with said electrode; providing a device in said vacuum; said device being in motion relative to said electrode and being in mechanical contact with said electrode over a contact zone. The device removes material from said electrode or said device applying material to said electrode, wherein the material is in a solid state. No combination of Szczyrkowski and Wang teaches or suggests this combination of features.

For example, Szczyrkowski does not teach or suggest the step of providing a device in the vacuum and the device being in motion relative to the electrode and being in mechanical contact with the electrode over a contact zone, as correctly indicated on page 3 of the Office Action. Wang does not cure the deficiencies of Szczyrkowski because Wang also does not teach the steps of providing a device in the vacuum and the device being in relative motion to the electrode and being in mechanical contact with the electrode over a contact zone.

According to the PTO, the preventive maintenance scheme of Wang provides a device in the form of a polishing tool (Figs. 2-3 of Wang) wherein motion relative between the circular rotating polishing bit and an immovable target removes material or "nodules" from the target. (Page 3 of the Office Action.) However, this device and method of Wang does not teach the step of providing the polishing tool in a vacuum. Indeed, Wang discloses the opposite condition, the step of providing the polishing tool in a non-vacuum. For example,

Fig. 1 of Wang indicates that step 14 is “cryo pump regeneration,” which purges the gas that is contained in the sputtering chamber and assures adequate vacuum (column 5, lines 1-3 of Wang), but it occurs along a different process path from the “target polish” step in step 16 (which uses the polishing tool of Wang) and the “target clean and inspection” step in step 17. Because steps 14 and 16 occur along different process paths and step 14’s process path explicitly includes cryo pump regeneration, one of ordinary skill in the art would conclude that step 16 does not have such a cryo pump regeneration, and thus no vacuum is established. As a result, one of ordinary skill in the art would not conclude that the polishing tool of step 16 is used in a vacuum.

Also, steps 18, 19, and 20 of Fig. 1 of Wang involve the chamber being cycle purged, baked out, and burned in, respectively. (Column 5, lines 29-38 of Wang.) These steps imply that the vacuum must have been broken for target cleaning because in these steps the vacuum has to be fully restored.

Furthermore, Wang discloses that, during the polishing with the polishing tool, a high pressure stream of nitrogen is blown over the target to dislodge debris from the target, which is then followed by the dislodged debris being removed by the application of a vacuum. (Column 5, lines 20-26 of Wang.) One of ordinary skill in the art would necessarily conclude with the addition of gas to the chamber and the application of a vacuum to the chamber that the chamber itself is not a vacuum. Additionally, isopropyl alcohol is used for cleaning (column 5, lines 26-28 of Wang), the addition of which cannot be done under vacuum.

Finally, Wang discloses that preventive maintenance (including the use of the polishing tool) may be performed also when a processing tool is added or removed. (Column 3, lines 38-40 of Wang.) The conditions of adding or removing the processing tool implies that a vacuum is broken.

There is no indication in Wang that the polishing tool is used or could be made suitable to be performed in a vacuum. As a result, there is no indication that Wang discloses the step of providing a device in the vacuum and the device being in motion relative to the electrode and being in mechanical contact with the electrode over a contact zone.

Because no combination of Szczyrbowski and Wang teaches or suggests the step of providing a device in the vacuum and the device being in motion relative to the electrode and being in mechanical contact with the electrode over a contact zone, claim 1 is allowable.

Claims 2, 4-5, 10-13, and 15 depend from and contain all the features of claim 1, and are allowable for the same reasons as claim 1, without regard to the further patentable features contained therein.

Applicants respectfully note that the analysis with regards to the meaning of the “end zone” and the “erosion zone” in claims 10-12 is incorrect, and thus the rejection is improper. The PTO asserts that Fig. 1 of Szczyrbowski depicts an end zone on both sides of the permanent magnet array 13 that is not sputtered “since no magnetic field is present to trap a plasma against the target [25] surface.” (Page 3 of the Office Action.) However, the PTO overlooks the fact that the target 2 is rotating (column 4, lines 50-53 of Szczyrbowski), hence the target material 25 will be sputtered away as it enters the plasma. The “end zone” as defined in claim 10 is never sputtered even when the target is turning.¹ Furthermore, the “erosion zone” is not limited to the race track, but to the whole circumferential area of the tubular target.²

For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect

¹ See, for example, page 7, lines 18-21 and Fig. 1b of the present specification

² See, for example, page 7, lines 14-17 and Fig. 1b of the present specification.

information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. § 1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 672-5426
Facsimile: (202) 672-5399

By Matthew J. Kremer

Glenn Law
Registration No. 34,371

Matthew J. Kremer
Registration No. 58,671